CLAIMS:

1. A method for measuring sharpness in an image or picture comprising: partitioning the image or picture into one or more blocks, each of which has a predetermined size and repeating the following for each of the one or more blocks (11):

determining a kurtosis-based sharpness metric of the image (12); and

compensating the kurtosis-based sharpness metric to account for differences in sharpness enhancement in a horizontal direction and a vertical direction (13).

2. The method according to claim 1, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on an average number of edge pixels per block ($\overline{nep}$) (14).

3. The method according to claim 1, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on an average horizontal energy ($\overline{E_x}$) and an average vertical energy ($\overline{E_y}$) (15).

4. The method according to claim 1, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on an average horizontal energy ($\overline{E_x}$) and an average vertical energy ($\overline{E_y}$) and an average diagonal energy ($\overline{E_d}$) (15).

5. The method according to claim 1, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a geometric mean $(E_x * E_y)^{1/2}$ of the average horizontal energy ($\overline{E_x}$) and the average vertical energy ($\overline{E_y}$) (16).

6. The method according to claim 1, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on an arithmetic mean [½ ($\overline{E_x} + \overline{E_y}$)] of the average horizontal energy ($\overline{E_x}$) and the average vertical energy ($\overline{E_y}$) (16).

7. The method according to claim 1, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a geometric mean $(E_x*E_y)^{1/2}$ of the average horizontal energy ($\overline{E_x}$) and the average vertical energy ($\overline{E_y}$) and an arithmetic mean [½ ($\overline{E_x}+\overline{E_y}$)] of the average horizontal energy ($\overline{E_x}$) and the average vertical energy ($\overline{E_y}$) (16).

8. The method according to claim 1, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a number of blocks that contain edges (neb) (17).

9. The method according to claim 1, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a number of blocks that do not contain edges (nfb) (17).

10. The method according to claim 1, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a number of blocks that contain edges (neb) and a number of blocks that do not contain edges (nfb) (17).

11. The method according to claim 4, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on an average number of edge pixels per block ($\overline{nep}$) (14).

12. The method according to claim 7, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on an average number of edge pixels per block ($\overline{nep}$) (14).

13. The method according to claim 10, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on an average number of edge pixels per block ($\overline{nep}$) (14).

14. The method according to claim 12, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on an average horizontal energy ($\overline{E_x}$) and an average vertical energy ($\overline{E_y}$) and an average diagonal energy ($\overline{E_d}$) (15).

15. The method according to claim 11, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a number of blocks that contain edges (neb) and a number of blocks that do not contain edges (nfb) (17).

16. The method according to claim 4, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a geometric mean $(E_x*E_y)^{1/2}$ of the average horizontal energy ($\overline{E_x}$) and the average vertical energy ($\overline{E_y}$) and an arithmetic mean [½ ($\overline{E_x}+\overline{E_y}$)] of the average horizontal energy ($\overline{E_x}$) and the average vertical energy ($\overline{E_y}$). The ratio of the geometric to arithmetic mean raised to the power of 2, $\frac{4*\overline{E_x}*\overline{E_y}}{\left(\overline{E_x}+\overline{E_y}\right)^2}$, is the combined compensation term (16).

17. The method according to claim 16, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a number of blocks that contain edges (neb) and a number of blocks that do not contain edges (nfb) (17).

18. The method according to claim 13, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a geometric mean $(E_x*E_y)^{1/2}$ of the average horizontal energy ($\overline{E_x}$) and the average vertical energy ($\overline{E_y}$) and an

arithmetic mean [½ ($\overline{E_x} + \overline{E_y}$)] of the average horizontal energy ($\overline{E_x}$) and the average vertical energy ($\overline{E_y}$) (16).

19. The method according to claim 4, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a number of blocks that contain edges (neb) and a number of blocks that do not contain edges (nfb) (17).

20. The method according to claim 7, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a number of blocks that contain edges (neb) and a number of blocks that do not contain edges (nfb) (17).

21. The method according to claim 14, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a number of blocks that contain edges (neb) and a number of blocks that do not contain edges (nfb) (17).

22. The method according to claim 1, wherein the compensating includes calculating the following equation:

$$Sh = f_1\left[C_1 + C_2 * \overline{k} * \overline{nep} * \frac{(\overline{E_x} + \overline{E_y} + \overline{E_d})}{\overline{E_d}} * \frac{4 * \overline{E_x} * \overline{E_y}}{(\overline{E_x} + \overline{E_y})^2} * \frac{neb}{nfb}\right] + C_3 * \overline{nep},$$

wherein:

Sh is a sharpness metric;

f_1 is a predetermined function;

C_1, C_2 and C_3 are predetermined constants;

$\overline{k}$ is an average kurtosis;

$\overline{nep}$ is an average number of edge pixels per block;

$\overline{E_y}$ is an average vertical energy;

$\overline{E_x}$ is an average horizontal energy;

$\overline{E_d}$ is an average diagonal energy;

neb is a number of blocks that contain edges; and

nfb is a number of blocks that do not contain edges (18).

23. The method according to claim 7, wherein the average vertical and horizontal energies are obtained by calculating values over the entire image (15).

24. The method according to claim 7, wherein the average vertical and horizontal energies are estimated from a sample of the image (15).

25. A method for measuring sharpness in an image or picture comprising:
performing a Discrete Cosine Transformation on each of a plurality of blocks of a predetermined size of the image; and
compensating for asymmetry using information on a number of edge pixels and an energy content of one or more vertical edges and one or more horizontal edges in each of the plurality of blocks (13).

26. An image processing apparatus (40) comprising:
an image detector (48a-e) to convert the image to an electronic version; and
a sharpness controller (41) coupled to the image detector to detect sharpness in the electronic version of the image and adjust the sharpness, said controller to calculate a sharpness metric of the image by:
partitioning the image or picture into one or more blocks, each of which has a predetermined size and repeating the following for each of the one or more blocks (11):
determining a kurtosis-based sharpness metric of the image (12); and
compensating the kurtosis-based sharpness metric to account for differences in sharpness enhancement in a horizontal direction and a vertical direction (13).

27. The apparatus according to claim 25, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on an average number of edge pixels per block ($\overline{nep}$) (14).

28. The apparatus according to claim 25, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on an average horizontal energy ($\overline{E_x}$) and an average vertical energy ($\overline{E_y}$) and an average diagonal energy ($\overline{E_d}$) (15).

29. The apparatus according to claim 25, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a geometric mean $(E_x * E_y)^{1/2}$ of the average horizontal energy ($\overline{E_x}$) and the average vertical energy ($\overline{E_y}$) and an arithmetic mean [½ ($\overline{E_x} + \overline{E_y}$)] of the average horizontal energy ($\overline{E_x}$) and the average vertical energy ($\overline{E_y}$) (16).

30. The apparatus according to claim 25, wherein said compensating includes adding a term to the kurtosis-based sharpness metric based on a number of blocks that contain edges (neb) and a number of blocks that do not contain edges (nfb) (17).

31. The apparatus according to claim 28, wherein the average vertical and horizontal energies are obtained by calculating values over the entire image (16).

32. The apparatus according to claim 28, wherein the average vertical and horizontal energies are estimated from a sample of the image (16).